



WASHINGTON STATE DEPARTMENT OF  
**NATURAL RESOURCES**



October 25, 2024

**TO:** Forest Practices Board

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**SUBJECT:** 2023 Annual Report on the Voluntary Cooperative Protection Approach for Western Gray Squirrel (WGS)

On November 12, 2013, the Forest Practices Board (Board) requested the Washington Department of Natural Resources (DNR) and Washington Department of Fish and Wildlife (WDFW) to report annually on the status of Forest Practice Applications (FPAs) that may need WGS management plans, and the success of the voluntary protection approach. DNR and WDFW will present this report at the November 13, 2024, Board meeting.

The attached tenth annual report covers the period from January 1, 2023, through December 31, 2023. It includes information from WDFW's tracking dataset for FPAs and voluntary WGS conservation actions, which is necessary to evaluate how well the voluntary protection approach is working for WGS. Further content describes historical and recent actions relevant to WDFW's research efforts on the distribution and habitat status of the squirrel, other forest landowner activities addressing WGS conservation, and protection by counties.

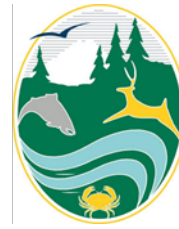
We look forward to discussing the 2023 report with you at the November meeting. If you have questions in the meantime, please do not hesitate to contact us: [colleen.granberg@dnr.wa.gov](mailto:colleen.granberg@dnr.wa.gov) or 564-200-3496; [darrin.masters@dfw.wa.gov](mailto:darrin.masters@dfw.wa.gov) or 360-764-9942.

Attachment (1)

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WASHINGTON STATE DEPARTMENT OF  
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Washington  
Department of  
**FISH and  
WILDLIFE**

## **2023 Annual Report to the Forest Practices Board**

### **The Status of a Voluntary Protection Approach for the Western Gray Squirrel October 25, 2024**

#### **SPECIES BACKGROUND**

The Washington Fish and Wildlife Commission listed the western gray squirrel (WGS) as state threatened effective November 14, 1993. On December 28, 2023, WGS was uplisted to state endangered.

In Washington state, the species occurs in three primary areas: oak and conifer forests of Klickitat and southern Yakima counties; low to mid-elevation dry conifer forests in Okanogan and Chelan counties; and oak and conifer forests on Joint Base Lewis-McChord (JBLM) in Pierce and Thurston counties.

The WGS inhabits transitional forests of mature Oregon white oak, Ponderosa pine, Douglas-fir, and various riparian tree species (Linders and Stinson 2007). Habitat quality in Washington is assumed to be relatively poor compared to other parts of the species' range due to the lack of oak species diversity and degradation of pine and oak habitats. Cumulative effects of land conversion, logging, sheep grazing, and wildfire suppression largely eliminated open-grown stands of mature and old growth pine and have degraded oak woodlands (Linders and Stinson 2007).

The most recent population estimate for Washington (1994 to 2005 by Linders and Stinson, 2007) was between 468 and 1,405 squirrels ( $937 \pm 50\%$ ). Over the past decade, the southern Puget Trough population (on JBLM) experienced some growth, largely due to habitat improvements and efforts to augment the squirrel population at JBLM between 2007 and 2012. Research and local surveys conducted in the North Cascades after that period indicated that the population was higher than the 2007 estimate but likely declined following wildfires in 2014, 2015, and 2021.

Key threats to western gray squirrel populations in Washington include habitat loss, degradation, fragmentation, small population size and isolation, disease, and road mortality. Habitat loss is associated with factors such as timber harvesting, wildfires, land conversion, and fire suppression. Current and future climate change contributes to larger and more frequent stand-replacement fires, alters forest composition, and impacts food sources.

#### **HISTORY OF FOREST PRACTICES BOARD ACTIONS**

In 2013, staff from the Department of Natural Resources (DNR) and Washington Department of Fish and Wildlife (WDFW) collaborated on administrative and operational improvements to facilitate voluntary WGS conservation measures as part of approved Forest Practice Applications/Notifications (FPA/N). DNR staff incorporated these improvements into FPA/N processing, which has since been applied to all FPA/Ns potentially having WGS present within

the proposal area or within proximity to areas exhibiting suitable WGS habitat characteristics. Key components of this guidance include:

- DNR notes the presence of WGS or their habitat on the DNR *Office Checklist Page #2*, which becomes part of the FPA/N.
- DNR provides WDFW a courtesy email that an FPA/N has triggered a “hit” for potential WGS presence within the vicinity of the FPA/N. This provides notification on all new FPA/Ns sent out for review to DNR forest practices foresters, WDFW biologists, and interested stakeholders that WGS or their habitat may be present within the proposed forest practices activity area.
- DNR includes a “note” on the FPA/N *Notice of Decision* page acknowledging the presence of WGS or their habitat within the harvest vicinity and refers applicants to WDFW staff for assistance. Though this note is not a condition of the application, it is expected to inform the proponent of the potential occurrence of WGS and/or their habitat and to provide WDFW contact information. This note further improves communication and increases the likelihood of voluntary WGS protection during forest practices.

On November 12, 2013, the Board directed DNR and WDFW to report annually on the number of FPAs that might involve WGS conservation needs and the effectiveness of the voluntary protection approach. This report describing 2023 forest practice activities related to WGS marks the tenth annual report to the Board.

### **2023 FOREST PRACTICES APPLICATIONS/NOTIFICATIONS (FPA/Ns)**

WDFW and DNR continued screening FPA/Ns for potential impacts to WGS using WDFW’s point and polygon GIS data cataloging presence, nest locations, and/or potentially suitable habitat. DNR notified WDFW for all FPA/Ns that are within ¼-mile of these locations. Once notified, WDFW regional biologists evaluated the FPA/Ns to confirm conflict by working with the landowner/land manager to conduct WGS nest surveys (if suitable habitat is identified), discuss forest management goals, and develop voluntary measures to help protect WGS. Typically, forest management strategies incorporate conservation measures identified in WDFW’s *Priority Habitats and Species Management Recommendations for Western Gray Squirrel* (PHS – Linders et al. 2010).

WDFW tracks WGS-associated FPA/N information using its WGS Survey Application tool (*Survey123*, supported by ArcGIS Online). Information collected includes FPA/N number, proponent name, forest practice location (county), whether the applicant is a large or small landowner, results of a WGS nest survey (presence/absence), WGS conservation measures agreed upon by the parties, and any additional pertinent information.

The following is a summary of FPA/Ns that triggered a WGS “hit” from January 1, 2023, through December 31, 2023:

- A total of 51 FPA/Ns were identified as potentially being associated with WGS.
- Of these, 50 were in Klickitat county, and one in Skamania, county.
- All were associated with large/industrial landowners, and 6 were associated with a small forest landowner.
- 24 permits were issued for even-age harvests totaling 1,668 ac.
- 27 permits were issued for uneven-age harvests totaling 3,488 ac.

## WESTERN GRAY SQUIRREL CONSERVATION

During the review process for FPA/Ns related to WGS, WDFW continued to promote conservation efforts by supporting landowners when conducting WGS nest surveys and coordinating with them to implement voluntary WGS conservation measures. A large part of this effort involves education and cooperative development of harvest strategies that benefit the squirrel. A priority for WDFW is for industrial timber management companies to implement conservation prescriptions on their lands by following guidance in the PHS recommendations for WGS. They typically incorporate nest surveys and habitat retention strategies into harvest planning and layout.

WDFW staff frequently work with small forest landowners by conducting WGS nest surveys and developing conservation strategies when WGS presence is confirmed on their land. The goal is to educate and develop voluntary management strategies that meet landowner needs while also protecting WGS and their habitat, which can be challenging depending on the type of harvest (thinning versus a clearcut), the intended post-harvest forest conditions, and/or the economic interests of the landowner.

The following is a summary of WGS-related forest management activity for January 1 through December 31, 2023.

- All 51 FPA/Ns involved the need for further review, including such tasks as:
  1. Additional GIS analysis.
  2. Confirmation of WGS presence or absence (e.g., conducting a WGS nest survey).
  3. Confirmation that WGS protection and/or habitat conservation strategies would be implemented during forest practice activities.
- Fifteen landowners incorporated recommendations for conservation measures. For each application, the landowner agreed to implement one or more of the following WGS management actions:
  1. Clearcut with nest tree retention and buffers
  2. Clearcut with nest tree retention, buffers, and arboreal connectivity
  3. Clearcut with nest tree retention only
  4. Thinning for oak release
  5. Thinning while maintaining arboreal connectivity
  6. Thinning with oak tree retention
  7. Thinning with nest tree retention
  8. Thinning, nest tree buffers, oak retention, fire risk reduction

Evaluating post-harvest effectiveness of conservation measures continues to be an issue because of staff time constraints. Ultimately, knowing more about how the PHS management recommendations may be influencing continued WGS occupancy of sites after harvests would allow WDFW to enhance its adaptive management approach to WGS conservation.

In November 2021, The Conservation Fund purchased 35,500 acres of land in Klickitat county through its affiliate, Lupine Forest LLC. Their primary goal for the land is to implement long-term conservation strategies that benefit wildlife and aquatic resources while maintaining

sustainable forest management activities. Lupine proposes to use uneven-aged regeneration methods that promote and maintain structural and compositional forest diversity, providing habitat for a variety of terrestrial and aquatic species. The lands will be managed as a working forest, contributing to the local forest economy. Individual tree and group selection harvest as well as enhancing Oregon white oak habitat will create a historical forest condition providing for new conifer age classes and vigorous established conifers.

### **WDFW RESEARCH AND CONSERVATION EFFORTS**

In 2021 and 2022, WDFW completed two scientific studies to support future management decisions. The first was a survey of site occupancy, which can be used to monitor the rate of change in squirrel distribution across the landscape over time. The second was a habitat change analysis. This study evaluated the percent change in WGS primary habitat between 1993 (when the WGS was listed as state threatened) and 2017. The results of these studies were used to inform a Periodic Status Review (PSR) of the species drafted in early 2023. PSRs are required for all state-listed species and are often used as a basis for up-listing or down-listing imperiled species. The results of these documents are briefly described below. For details about each study, please refer to the literature cited at the end of this document. Copies of the studies are available upon request.

*Occupancy Survey.* Early work on western gray squirrels in the state largely focused on habitat and species' ecology; describing preferred habitat characteristics, nesting behavior, activity patterns, and diet. While project specific efforts were made to estimate distribution and abundance, the methods employed were not repeatable, making them insufficient for long-term population monitoring. To remedy this, WDFW initiated a study in 2018 to assess the rate of occupancy of core habitat within the three population centers across the state (Vander Haegen and Keren 2021). There is a well-known relationship between occupancy and abundance (population count) in the ecological literature. When occupancy increases, abundance increases. Therefore, changes in the rate of occupancy over time can be used to infer positive or negative population trends.

The survey spanned three years. A total of 138 sites were surveyed across the state; 18 in the Puget Trough population (JBLM), 60 sites in the North Cascades population (Okanagan and Chelan counties), and 60 sites in the South Cascades population (Klickitat county). Occupancy rates for the three-year timeframe ranged from 0.27 to 0.44 across the three core population areas. The results of this survey provide a baseline for future occupancy modelling efforts. More importantly, the research design provides a repeatable framework to assess the trajectory of western gray squirrel populations over time, which in turn, will provide a solid foundation to inform management decisions. See Vander Haegen and Keren 2021 for a detailed account of this effort. WDFW is currently planning to repeat the occupancy survey starting in 2025.

*Habitat Change Assessment.* WDFW published its final report (Vander Haegen and others 2022) of a project to assess the change in extent of WGS habitat from 1993 (the year of listing as state Threatened) to 2017 (the latest year suitable orthoimagery data were available). The assessment focused on lands comprising the North and South Cascades populations. The species was listed in 1993 because of habitat loss and fragmentation. Since that time, there has been no effort to monitor or evaluate the extent of habitat change. In 2017, WDFW began a four-year effort to quantify WGS habitat change on a landscape scale across the North and South Cascades

population centers. The project first defined areas of potential range based on Washington's State Wildlife Action Plan (2015) and then refined the areas based on ecological systems and elevation to produce potential primary habitat maps. To analyze change on a fine scale, 1001 random one ha plots were placed (in GIS) within potential primary habitat in the North Cascades area and 1005 plots in the South Cascades area. All plots were systematically analyzed to determine the percent tree canopy cover, apparent tree size, and the spatial distribution of trees across each plot. The procedure was first completed with orthoimagery from 1993 and then repeated using imagery from 2017.

The results of the analysis estimated a net loss of 20.8% of primary habitat in the North Cascades and 21.2% net loss in the South Cascades. The primary driver of loss in the North Cascades was wildfire although timber harvest activities, largely in the form of thinning, were also a contributing factor. In the South Cascades, timber harvest was the primary driver with 55% of the issued Forest Practices permits focusing on thinning and 45% on clearcutting. Wildfire also played a small roll in habitat loss during the time period. Further, the authors concluded that assumed gains in habitat from successional processes over the time period did not compensate for assumed loss of habitat across both study areas. See Vander Haegen and Others (2022) for a detailed account of this study.

*Spatial Habitat Prioritization Model.* A Wildlife Diversity grant was awarded in early 2024 to a group of economists at the University of Washington. The purpose of the project is to create a spatial model that maximizes habitat restoration for the endangered western gray squirrel in Washington State. WDFW's Wildlife Diversity Grant Program aims to support recovery actions for a suite of Species of Greatest Conservation Need (SGCN) that are state-listed or candidates for listing. In July 2024, the program awarded the University of Washington \$100,724 to develop a spatial prioritization model that can identify priority land parcels for targeted conservation efforts to aid the recovery of the Klickitat county's WGS population. The vast majority of Klickitat county's WGS habitat is on privately held forest lands and the model will also aid in developing incentives for landowners adopting WGS habitat restoration recommendations. The project team will run several model scenarios and create a report detailing the data, model, and model results by June 30, 2025.

#### **PROTECTION BY COUNTIES**

Washington's *Growth Management Act* (Chapter 36.70A RCW) requires that local jurisdictions protect critical areas, including fish and wildlife habitat conservation areas. Regulations specify that counties should identify and classify habitat for federal and state listed and sensitive species and should utilize the PHS database when doing so (WAC 365-190-130(4)(a)). The PHS database contains GIS location data for WGS and is routinely requested by counties to support land use planning. These are the same data that WDFW and DNR staff use to screen FPA/Ns, as well as other proposals going through the State Environmental Policy Act (SEPA) process for potential project impacts to WGS.

#### **Periodic Status Review and State Uplisting**

*Periodic Status Review.* A Periodic Status Review incorporating results of the statewide western gray squirrel occupancy surveys and the statewide habitat change assessment was completed August 2023. The draft PSR received 227 public comments during the 90-day comment period. The recommendation to up-list western gray squirrel to endangered status was presented to the

Fish and Wildlife Commission in October 2023 and the Commission voted in favor of the reclassification. The squirrel was officially uplisted to state endangered on December 28, 2023.

Following the uplisting, DNR consulted with WDFW about actions needed for the development of Forest Practices Critical Habitat. This consultation resulted in a recommendation by WDFW to form a wildlife working group composed of multiple stakeholders to develop a workable conservation strategy for WGS conservation. WDFW believes that developing a management approach that is supported by landowners, conservation organizations, tribes, and state agencies is the best path forward for long-term western gray squirrel conservation. During the February 2024 Forest Practices Board meeting, WDFW and DNR requested that the Board approve the formation of the working group. The Board agreed and approved by motion to form the group. As previously reported to the Board, the working group will initiate meetings this fall.

#### **SUMMARY**

Throughout 2023, all proposed forest practice activities identified as potentially affecting WGS were screened by WDFW and DNR. WDFW, DNR, and landowners (or their consultants) conducted WGS nest surveys as needed and worked with proponents to conserve WGS when present within a harvest area. FPA/N-associated WGS nest surveys, combined with screening of FPA/Ns, allows WDFW and DNR to continue evaluating the effectiveness of the voluntary protection approach in achieving WGS conservation.

WGS remains a high priority species for conservation by WDFW. There continues to be a need for post-harvest effectiveness monitoring to evaluate the efficacy of the voluntary protection approach, however, limited staff resources often restrict that effort. The recent publication of the Habitat Change Report (Vander Haegen and others 2022) indicated that Washington is slowly losing primary habitat and that natural regeneration cannot keep up with the rate of decline. Because of this, WDFW made a recommendation to the Fish and Wildlife Commission to up-list the species from state threatened to state endangered. The squirrel was officially uplisted on December 28, 2023. With the recent uplisting, WDFW and DNR will need to work with landowners to craft a conservation strategy that not only reverses the habitat trajectory but also promotes a sustainable forest economy that so many people depend on. Indeed, conservation efforts are already in progress. For many years, landowners have been willing to survey for nests and adjust their harvest strategies to accommodate habitat. The Land Conservation Fund's recent purchase of 35,500 acres of land in Klickitat county with the intent to implement habitat conservation measures has the potential to benefit the western gray squirrel over the long-term. Lastly, WDFW completed the first study to document primary habitat occupancy rates across the squirrel's range in the state (Vander Haegen and Keren 2021). This will serve as a baseline for subsequent surveys in the years to come using the same methodology. Over time, the occupancy modelling results will tell us whether the conservation efforts are working by revealing an increase or decrease in occupancy rates. WDFW plans to conduct a second occupancy survey in 2025.

In 2025, WDFW will continue to conduct surveys and evaluate habitat to improve our knowledge of squirrel distribution across the state. The western gray squirrel wildlife working group will be essential to the development of conservation strategies that work for everyone.

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